

## PATENT COOPERATION TREATY

## PCT

REC'D 19 AUG 2004

WIPO



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 95 858 a/b	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 02/12916	International filing date (day/month/year) 18.11.2002	Priority date (day/month/year) 18.11.2002
International Patent Classification (IPC) or both national classification and IPC H04L1/18		
Applicant TELEFONAKTIEBOLAGET L M ERICSSON (PUBL).et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
- I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  09.06.2004	Date of completion of this report  18.08.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Snell, T  Telephone No. +49 89 2399-8802 

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/EP 02/12916**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*):

**Description, Pages**

1-21 as originally filed

**Claims, Numbers**

1-26 as originally filed

**Drawings, Figures**

1-5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

**Best Available Copy**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/EP 02/12916**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-26
	No: Claims	
Inventive step (IS)	Yes: Claims	1-26
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-26
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**Best Available Copy**

**Cited Documents**

- D1: US-B-6 405 3371 (SEIFERT JEFFREY D ET AL) 11 June 2002 (2002-06-11)  
D2: LIN D ET AL: "TCP fast recovery strategies: analysis and improvements"  
PROCEEDINGS. IEEE INFOCOM '98, THE CONFERENCE ON COMPUTER  
COMMUNICATIONS. SEVENTEENTH ANNUAL JOINT CONFERENCE OF THE  
IEEE COMPUTER AND COMMUNICATIONS SOCIETIES. GATEWAY TO THE  
21ST CENTURY (CAT. NO.98CH36169), PROCEEDINGS IEEE INFOCOM'98  
CONFERENCE O, pages 263-271 vol.1, XP002244467 1998, New York, NY,  
USA, IEEE, USA ISBN: 0-7803-4383-2

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step  
or industrial applicability; citations and explanations supporting such statement**

1. The invention relates to the field of flow control in data unit communication systems using feedback messages.
2. Closest prior art document D1 describes the use of a retransmission timeout, whereby a message which is not acknowledged is retransmitted on expiry of the timeout. This timeout period is conventionally fixed to account for all possible delays in the network and thus avoid wasted retransmissions. However, this fixed value can lead to long delays following a lost packet. In order to improve the performance, D1 therefore proposes an adjustable timeout period based on the measured round trip delay.
3. The present invention proposes an alternative solution to this problem in that it further makes use of a second, shorter timeout period, whereby if on expiry of the shorter timeout the available transmission capacity for unsent data is greater or equal to the data unit for retransmission, retransmission takes place. This enables a more aggressive retransmission policy to be employed without causing network congestion. Neither D1 nor D2, which describes the TCP fast retransmission algorithm based on receiving three duplicate acknowledgment messages sent when packets are received out of sequence, suggest the combination of a short and a long timeout, hence this concept is deemed to be novel and to involve an inventive step (Articles 33(1)-(3) PCT).

**Best Available Copy**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/EP 02/12916

4. Since method claim 1, apparatus claim 13, computer program claim 25 and data carrier claim 26 all incorporate the essential features of the inventive solution, the subject-matter of these claims meet the requirements for novelty and inventive step (Articles 33(1)-33(3) PCT).
5. Claims 2-12 and 14-24 are dependent on either claim 1 or claim 13 and hence also meet the requirements for novelty and inventive step (Articles 33(1)-(3) PCT).
6. Attention is however drawn to the following lack of clarity in claims 1 and 13 (Article 6 PCT):

It is not made clear that the second timeout period starts at the occurrence of the timeout monitoring procedure triggering event (ie at the same time as the start of the first timeout period), which is an essential feature of all embodiments of the invention. Moreover, the claims cannot be properly understood if the starting point of the second timeout period is not defined.